Editorial

Proteomics advancements in dentistry

Abbreviations

PCR, polyacrylamide; MS, mass spectrometry; AEP, acquired enamel pellicle; SKB, salivaomics knowledge base; PDL, periodontal ligaments

Editorial

Proteins are enormously composed of sophisticated 20 different types of amino acids. Proteins perform a crucial role in structural support, catalysis, and signal transmission, hence called "*working horses*" of a cell.[1] The word "*Proteome*" is amalgamation of two words "*protein*" and "*genome*", were first introduced by Mark Wilkins in 1986.[2] Proteomics is the special branch of life sciences that deals with the distribution and interaction of proteins in time, and space in cells, organisms or even within an ecosystem. For this contents of proteins sample measure through a sequence of separation, identification and in last counted by highly specialized proteomics tools such as polyacrylamide gel electrophoresis (2D-Gel), mass spectrometry (MS), real time-PCR, microarrays and chromatographical tools.[3–5] This discovery science brings revolution in biomedical sciences by revealing the normal physiological and pathological phenomenon occurring in living organisms.

In last two decades, proteomics technologies widely used in dentistry and produced huge amount of protein data regarding physiological conditions and pathological conditions.[6–10] In medical science literature electronic databases (e.g. PubMed, Scopus, and Google Scholar) search reported 60% to 70% use of different proteomical tools in normal or diseased dental tissues (enamel, dentin, pulp, cementum, alveolar bone, saliva, gingival crevicular fluids, acquired enamel pellicle, and oral mucosa) and dental materials for proteomic analysis.[11–16] *Siqueira et al.*[17] identified human acquired enamel pellicle (AEP) proteins composition through LC-ESI-MS/MS and detected 130 total proteins.[17] AEP provide selective permeability barrier that controls demineralization/remineralization and act as lubricating film, and its proteome configuration can help in understanding of dental decay processes.[18] Human whole mouth saliva is analysed frequently through proteomic tools due to its non-invasive, patient privacy control, and easy sampling. Approximately 3000 salivary proteome are reported in Salivaomics Knowledge Base (SKB), developed by the UCLA School of Dentistry, USA (www.hspp.ucla.edu/skb.swf).[19] Dame et al.[20] used a variety of analytical tools including gas chromatography mass spectrometry, nuclear magnetic resonance spectroscopy, direct flow injection/liquid chromatography mass spectrometry, inductively coupled plasma mass spectrometry and high performance liquid chromatography to calculate 308 salivary metabolites.[20] More recently, Mrozik et al.[21] evaluated the comparison of proteome between bone marrow, periodontal ligaments (PDL) and dental pulp through 2-DE, MS/MS.[21] Salmon et al.[22]comprehensively analysed proteomics of dental cementum through LC-MS/MS and detected 231 proteins, very interestingly researcher identified superoxide dismutase-3, a novel biomarker associated with cementum and cementum cells.[22]

To sum up, proteomics tools bring drastic change in diagnosis, treatment and prevention of dental diseases. With the help of proteomic tools dentistry getting specialized field which deals disease condition with minimal interventions.

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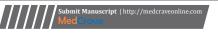
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Conflicts of interest

Authors declare that there is no conflict of interest.

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